

Strategy for Student Inclusion within a University-Based Business Incubator

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Abstract - The University of Bridgeport is the home of the CTech IncUBator, a joint initiative of the university and Connecticut Innovations, Inc. Inaugurated in 2010, the CTech IncUBator@University of Bridgeport assists new technology-based startups by providing a variety of benefits such as pro-bono and discounted professional services and shared support services and facilities. Through a grant from the National Collegiate Innovators and Inventors Alliance (NCIIA), a strategy and plan has been developed which will provide a sustainable method for students to work with the new CTech IncUBator and its businesses while gaining college credit and experience. Student excellence and entrepreneur teams (E-Teams) will either work with the incubator to develop and commercialize their own ideas or they will develop products with existing businesses (both inside and outside of the IncUBator). The project develops the necessary business and education structures to make a sustainable business relationship between UB students and the IncUBator and its associated companies.

Keywords: entrepreneurship, commercialization, prototype

INTRODUCTION

The process of taking a new product from concept to commercialization can be broken down into three phases: product concept, prototype development, and commercialization. Invention and innovation have a strong history at the University of Bridgeport. UB courses have produced many prize-winning student teams among competitors at the annual Connecticut Collegiate Business Plan Competition from both the School of Engineering and the School of Business. The Shintaro Akatsu School of Design has won a number of competitions regarding product design. Despite this strong history of invention at UB, however, no products have been commercialized, and few have been prototyped. Two semesters of focused coursework are needed to support student efforts if they are to progress beyond the product concept phase toward potential commercialization.

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The UB Industry Advisory Boards (IAB) for Business and Engineering have voiced a strong desire for educational programs and classes that require students to take an idea from conceptualization to market. This experience is needed for the development of the next generation workforce. This requires an understanding of market studies, financial evaluations, product design and manufacturing, and distribution. The IAB has also asked for inter/multi-disciplinary coursework that forces students to learn some aspects of the other disciplines and to cause real-world personality and technical issues to arise between functional areas. [2]

CTech IncUBator@University of Bridgeport is a new university-based incubator intended to hasten and support the growth of startup technology companies. The CTech IncUBator is located on the UB campus, and focuses only on technical startup businesses. The incubator's founding sponsors include Connecticut Innovations, Inc., the University of Bridgeport, and The United Illuminating Company.

The University of Bridgeport offers a variety of Bachelors and Masters degrees. As examples, the School of Business offers Bachelors and Masters of Business Administration; the School of Design offers B.S. in Industrial Design and M.P.S. in Design Management; the School of Engineering offers Masters degrees in biomedical engineering, mechanical engineering, electrical engineering, computer science and engineering, and technology management. The technical foundation is in place to make advances, but there is a need to strengthen the curriculum to allow students to put concentrated effort into product innovation, development and commercialization. All three of these mentioned Schools have coursework on product design and development, but no course brings the disciplines together to focus on taking a product concept to market.

HISTORY AND CONTEXT

Several master's level courses that include product concept development are currently taught through the School of Engineering: Marketing, Entrepreneurship and Innovation Issues; Design and Innovation; Product Management, Innovation, and Commercialization; Technology New Venture Creation; and Technical Capstone. The first is required for the M.S. in Technology Management degree program and the second is an elective for the M.S. in Mechanical Engineering. The other courses are electives or options for Technology Management students in their final year. While these courses are adequate for the first phase of the development process, the courses do not go beyond this step.

In addition, each department within the School of Engineering offers a similar set of courses for their students in their final semester(s): a two-semester (6 credit) thesis option, or a one to two semester (3-4 credit total) Master's project. A technical capstone course is an alternative to the Master's project in the Technology Management department. These courses are fairly typical of most graduate engineering programs in the U.S. The thesis option entails a research project. The Master's project may be research or application-based, but is done by a student working alone with an advisor. The technical capstone course focuses on the creation of a business plan, but lacks the time needed for student teams to create prototypes, and has not led to commercialization of any product concepts. More than 150 graduate engineering students take these courses each semester and the University of Bridgeport has one of the largest graduate engineering schools in New England. This enrollment will provide more than enough qualified students to create interdisciplinary E-teams. [1] Additionally, the School of Business MBA students take a similar capstone course in their final year and the Shintaro Akatsu School of Design students at both the Bachelors and Masters levels are required to take Design Studio courses. [2]

In October 2010, UB launched the CTech IncUBator on campus, in partnership with Connecticut Innovations, the State of Connecticut's quasi-public authority for technology investing and innovation development. The CTech IncUBator is Fairfield County's first and only university-based incubator for high-tech startups. The IncUBator's purpose is to assist in commercializing new technologies, create jobs and foster regional economic development. The IncUBator's tenants often chose to locate in the incubator because of partnerships that are possible with UB faculty and students.

CTech IncUBator is the ideal place through which to establish a proposed Center for Student Entrepreneurship and Innovation. Faculty from three engineering disciplines (technology management, mechanical, and electrical

engineering) as well as faculty from the School of Business and School of Design will initially collaborate to develop the center. Participating faculty will operate within the Ernest C. Trefz Center for Venture Management and Entrepreneurial Studies at the university. In addition, the local SCORE office (“Counselors to America’s Small Business”) is part of the Trefz Center, and has expressed interested in working with us. The Shintaro Akatsu School of Design also provides workshop facilities that make creating a wide range of prototypes possible.

The UB group’s plan is to develop a center and work with students in their final year of their degree programs, create inter-disciplinary entrepreneurial student teams (E-teams), and link them with the IncUBator and companies in Connecticut (both inside and outside of the incubator). The recent opening of the UB IncUBator creates an opportunity for students to take innovative ideas to a new level that was not previously possible. The proposed center’s faculty members will focus on linking the student teams with the resources of the IncUBator. Students may create their own company or work with existing companies. In so doing, the university will: a) create the goals, roles, procedures, and relationships that must be developed for students to successfully work with the IncUBator and its related companies and b) create models of success that will demonstrate to area companies the advantages of working with graduate student E-teams.

E-TEAM OPERATION AND PROCEDURES

The university has moved forward to create new curricula, making it possible for students of various degree programs to work together on entrepreneurial problems. A Product Commercialization course will be available to the Schools of Business, School of Engineering, and the School of Design and offered in Fall 2012. The course will span two semesters.

Students who have two semesters remaining to complete their degree programs will be solicited. Students will need to be identified and teams formed before the beginning of the student’s final year. The focus of what the student would learn in the E-team and Product Commercialization course will be dramatically different than the traditional solo Master’s research project. At the conclusion of each E-Team project, a detailed report will be written and presented, similar to those required for Master’s projects. The E-team will also need to present a prototype and a comprehensive business plan.

The faculty will propose and create interdisciplinary teams based on the skills of interested students and on the needs of local companies. (This is in part because the students are from different schools at the university and probably will not be acquainted with one another.) All projects during the first two years will be in the areas of human health or environmental engineering. E-teams will either work with an existing company or will create their own company. Local companies can be either a part of the IncUBator or external to the IncUBator. Students who form their own company may work with the IncUBator to develop their product. The services of the IncUBator include: shared office support services, pro-bono and discounted professional services (e.g. legal, accounting, intellectual property, technology, product commercialization and SCORE advisors), an entrepreneurial environment conducive to exchanging information, ideas and solutions, access to campus facilities and resources, introductions to potential investors and pre-seed and seed funding programs. [1]

Ownership of any intellectual property would be governed by the Intellectual Property (IP) policy of the university. For work that was directly funded by an outside company, the company would own the intellectual property. For work that was not directly funded by a company (including work funded by NCIIA), IP ownership would follow the university policy of joint ownership.

Students are expected to take a product concept and create product prototypes and a business plan. For teams working with a company, the business plan would take the form of how the firm could produce and market the new product, including financial and sales forecasts. The prototype will be important for demonstrating product characteristics. This is not an internship, and the company they are working with will not pay students.

For teams working on their own, the business plan would take the form of a formal business plan that could be presented to potential investors (or to obtain a grant, work with a bank, etc.). The incubator has contacts such as

Connecticut Innovations (founding sponsor of the incubator) for connecting teams having viable product ideas with potential investors, creating the opportunity for student teams to continue their work beyond the classroom and potentially creating a small business for themselves.

Commercial activity resulting from this program would take one of two forms. For E-teams working with a company, commercialization would be a part of that company's business process. For E-teams working on their own, they could form their own firm within the business incubator, and receive the services as any other startup firm would. These services include those previously listed, including access to public and private grant opportunities.

The E-Team faculty advisors expect to handle up to 25 new students each semester over the four semesters of the pilot program. One hundred students may be impacted during this two-year period. The project's core team of faculty along with additional volunteers will work with the students. This proposal will benefit our significant population of minority and female students, giving them unique opportunities to explore product innovation.

EVALUATION AND SUSTAINABILITY PLAN

Success needs to be tracked in ways other than the number of new products that are successful in the market. From business experience, we know that few product concepts ever make it to market, and that most new product introductions fail to achieve commercial success. Rather, we need to focus on the impact that the student teams have on their companies.

Success will be measured by success in the following areas: 1) all E-teams are expected to complete a prototype; 2) for E-teams that work with a CTech IncUBator company, success will also include one or more of the following outcomes, a) they cause a change in products already in the market, b) they cause a change in new product plans, c) they introduce a new product concept to the company and more than one person in the company works to evaluate commercialization, d) they introduce a new product into the market, e) they introduce a radically new method for building a product or delivering a service; 3) for E-teams working as an independent company with the incubator, success will also include one or more of the following outcomes: a) they cause another company to seriously evaluate commercializing their idea and b) they introduce a new product into the market. Overall project success will also be measured by at least one E-team prototype achieving commercialization.

In addition to standard university student course evaluations, the Center faculty will develop an independent assessment metric. This information will be used to evaluate student preparedness to construct a prototype, project management issues, interpersonal issues (for example, issues encountered with teams formed with students from different departments or undergraduate and graduate students on the same E-teams), enhancement of student self-confidence in learning and actual to planned time commitments required to develop a prototype.

STUDENT CONCERNS AND QUESTIONS

The students, of course, have many questions. To address these areas a website for the endeavor will contain an explanation of: the opportunity for students, what a business incubator is, what the UB IncUBator is and how it operates, resources and services available to students through the IncUBator, how student E-Teams may be formed, the application process, resubmission of a proposal, availability of grant funds, intellectual property rights, application forms, and also provide the ability to submit applications through the website. To facilitate communications with the E-Team Faculty Committee a specific email address will be established. (Mishra, 2011)

Formation of Student Teams

All students of the University of Bridgeport are eligible to participate: this includes graduate students and undergraduate students with senior project requirements within their program of study. Both domestic as well as international students may apply. International students have been specifically interested in this information. International students often find that grants, US government funding, fellowships, scholarships and internship funds are restricted to US citizens. Availability of this opportunity and prospective project grant funds to international students was extremely welcome information.

The minimum team size is three students and the maximum is five students. Students are encouraged to include team members from different departments (for example, an MBA student, mechanical engineering graduate student and industrial design undergraduate senior). Team diversity, in fact, will more closely emulate a true business and entrepreneurial environment.

Mechanics of Student Proposal Submission

Student potential ideas are documented and shared with department head(s) or department designees. Department approved initial ideas can proceed to project proposal submission, which is evaluated by the E-Team Faculty Committee. The final selection step involves an E-Team presentation for award of funds. If a team involves students from different departments, students need to obtain approval from all the department chairmen or their designated faculty representative.

Students have questioned how the mechanics of proposal submission operates if a student, for example, in Technology Management, has an idea related to electrical or electronics. Students can pursue such concepts if they or their team has the appropriate technical or academic knowledge or experience.

Other student concerns raised have been in reference to concepts with potential “huge markets”. What if the student or team is unsure of the technology needed? Students are advised not to submit their idea until they work with the department chairman or their designated faculty representative and obtain assistance in understanding the applicable technology. Submitting a vague or unclear proposal which includes fundamental science, engineering or technology which does not yet exist will generally result in an unsuccessful proposal.

Application Content

Student concepts approved by their department head (or designated department E-Team coordinator) may prepare applications. The applications include a cover sheet, budget spreadsheet and the proposal. The cover sheet includes the title of the proposal, department(s) and contact information for the proposed E-Team leader and team members and an executive summary. All team members submit one-page resumes which include their cumulative grade point average (GPA). The proposal content (excluding the cover sheet and resumes) is limited to three pages; however drawings and diagrams may be included in an additional appendix. The proposal needs to include an overview of the idea or concept and its form (i.e. product, methodology, and software), the market need, an explanation of the technology needed to actualize the product and resources needed from the IncUBator.

Deadlines for submission are March 31st for the following fall semester and October 31st for the following spring semester. It is anticipated that the E-Team Faculty Committee will meet and evaluate the proposals with decisions within 15 days from the fall and spring semester deadline dates. Proposed E-Team leaders will be contacted with the committee’s decision. Approved team concepts move forward to the next step – the team presentation. Written feedback will be provided to unsuccessful teams.

In general proposals may be rejected if: a) the concept is neither new nor novel; b) the application, the proposal concept or the need for the technology is not clear or convincing; c) the concept is too hypothetical or complex to be prototyped and commercialized; d) the idea is good but it is the belief of the evaluation committee there is no need for the product/service in the market or the fundamental technology needed to develop the product does not exist.

If the evaluation committee highly ranks an E-Team proposal, the students’ next step is to prepare a detailed report and make a presentation to the evaluation committee. If requested the student team must present between April 10th to April 20th for the fall semester or November 10th and November 20th for spring semester.

The presentation should not be more than 30 minutes out of which the team will have 20 minutes to present their proposal and 10 minutes for committee questions. The presentation includes an explanation of the concept, product, service or methodology, feasibility, project plan including prototyping and commercialization, justification (facts and figures) to support their presentation. Students must include a budget, the sources and uses of funds, a proposed income statement, and break-even analysis.

Resubmission on Rejection

Students, of course, may be disappointed on rejection, yet the committee feedback will be important in the development of their idea and possible resubmission. Students will be allowed to resubmit their idea for the same or a later semester. However, guidelines have been established for resubmission. Specifically, concepts submitted which need further details may be resubmitted, but students need to seek the approval once again of their department chairperson or department designated representative. Concepts deemed too hypothetical or not new or novel can be resubmitted with additional detail, but once again department approval is needed. However, completely new concepts will not be accepted, since the faculty feels this would simply be an extension of the original deadline. [3]

Awarding of Grant Funds

Grant money may or may not be allocated to an E-Team. Only some of the projects selected to use CTech IncUBator@University of Bridgeport will be provided grant funds. In general, these funds will be used for supplies, materials or fabrication costs needed to prototype a concept.

Additional Miscellaneous Questions

Additional questions have been asked that have provided the faculty team “food for thought” and will be the subject of future discussions, resolution and documentation. These questions are “How can this project or the IncUBator help in job placement for students?” and “How can the IncUBator find investors that can support the endeavor after the student has left UB?” In this latter case, a university course titled, “New Venture Creation”, taught by the Technology Management department covers this topic, but will be incorporated into the new proposed Product Commercialization course. Additionally, one of the current services of the incubator includes introductions to potential investors and pre-seed and seed funding programs. The CTech IncUBator will provide this support until the end of the team’s two-semester coursework, with the intention that during the Product Commercialization course, students will align this funding.

SUMMARY

A proposed Center for Student Entrepreneurship and Innovation will create the infrastructure for providing students the opportunity to work with area companies or directly with the new IncUBator. This will allow the University to take innovation and entrepreneurship to a higher level than has been possible in the past by strengthening our existing curricula. It offers our students the opportunity to actually live in an entrepreneurial environment while obtaining college credit for the experience.

The project’s objectives are: to provide student teams with the resources to build prototypes, marketing materials and perform patent surveys in support of commercializing new products; to increase opportunities for success for student teams in commercializing their product concepts and to improve the learning potential of interdisciplinary student teams at the university.

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